Neptun code: _____ Name: _____

Instructions:

- *Do not use any help, including your own notes, printed or written.*
- *Please, use a pen; corrections are not accepted.*
- *Choose the best answer from the circles and mark answers by T (true) or F (false), appropriately, from the squares.*
- *Do not guess: if you are uncertain, skip the problem and leave the mark clear. On wrong answers you get negative points.*
- *A score for each problem is assigned so as to yield a 0 expectation value in case of random guessing.*
- *Point values are assigned to total scores based on the standard deviation σ of random guessing as follows:*

score	point	
0.625 σ	12.5	minimum to pass the test
≤ 0	0	
$\geq 2.5 \sigma$	50	
in between:	20 σ	

Scores in this test: maximum = +30, minimum = −25, σ = 13.04, minimum to pass = 8.15.

1. Two phases of a material is observed in a container. The phases are persistent if either the ambient pressure or the temperature is changed to new equilibrium values. At least how many components are in the system? *(Score: +10 for the correct choice, 0 for no choice, -5 for any other possibility.)*
   - ⃝ 1
   - ⃝ 2
   - ⃝ 3
2. Which diffusion model is the most appropriate for a single-phase multi-component turbulent flow? *(Score: +10 for correct choice, 0 for no choice, −10 for the wrong choice.)*
   - ⃝ Fick's 1st Law.
   - ⃝ Equimolecular counter-diffusion.
3. An immiscible gas–liquid mixture is transported in a horizontal pipe such that both phases are contiguous. The flow pattern may be:
   - ☐ Dispersed Bubble Flow
   - ☐ Stratified Flow.
   - ☐ Stratified–Wavy Flow.
   - ☐ Plug Flow.
   - ☐ Slug Flow.
   (Scores: +2 for each correct answer, 0 for no choice, −2 for each wrong answer.)
... and more questions like this...